

SOUTHWARD MIGRATION AT NGULIA, TSAVO, KENYA 1978/79

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This is the third one-season account of autumn Palaearctic migration at Ngulia. The previous two appeared in this journal (Backhurst & Pearson 1977, Pearson & Backhurst 1978) and it is intended to document each season's results for as long as the site is fully worked.

ACCOUNT OF THE SEASON

Ngulia Safari Lodge was manned by two to five ringers for four periods: 29-30 October, 5-8 November, 22 November - 11 December and 27 December - 7 January. The times when no cover was provided coincided with large moon conditions when numbers of migrants attracted to the lights are much reduced (see Pearson & Backhurst 1976). A list of birds ringed, with their scientific names, is given in Table 1. The very high total of over 8000 Palaearctic migrants was due to very thorough coverage and to a preponderance of misty and/or rainy nights. In fact, the season was exceptionally wet, with over 300 mm of rain recorded at the Lodge itself between late October and early January. Three-quarters of the birds ringed were caught at night.

Falls of birds in mist during the early hours of 30 October and on all four nights in early November resulted in 1212 migrants ringed, and served to demonstrate more convincingly than ever before those species which are mainly early migrants (see Pearson & Backhurst 1978) and which, because suitable catching conditions are unusual at this time of year, are seldom caught in any quantity.

The night of 29 October was clear; no passerines were seen although an adult Reed Warbler was caught in bush near the Lodge next morning. On 30th, mist descended for 2 h from 02:00, during which about 200 migrants were seen and 22 caught. The composition of this catch was highly unusual: there were only two warblers (both Whitethroats) but 11 *Oenanthe* spp. (6 Isabelline, 4 Eurasian, 1 Pied), 6 Rufous Bush Chats and 3 Spotted Flycatchers. Only five more birds were caught in the bush after dawn. This was only the second occasion that an October visit to Ngulia had coincided with mist, and the first on which night movement, albeit on a very small scale, had been recorded before the beginning of November.

The four nights 5-8 November were all misty. By contrast with the previous week, the volume of passerine migration was now considerable, and a large catch of interesting species variety was made. Sprossers were now dominant (680 ringed) with Whitethroat a poor second (107) followed by Rufous Bush Chat (64) and Spotted Flycatcher (57). The passage of Marsh Warblers, overall the dominant Ngulia species, was just beginning (36 ringed), and most of the species normally occurring in late November were already represented. Eurasian Nightjars were seen at night, and 15 were caught on 7th, while the three wheatear species, Rock Thrush and Nightingale continued to appear in small but nevertheless unprecedented numbers. On 5th, after ½ h of torrential rain just after midnight, Eurasian Swallows appeared and settled in the trees in hundreds; 28 were caught (more than the overall 1969/78 night total) together with a single Sand Martin. Two more Sand Martins and 4 Swallows were caught at night later during this visit. An Eleonora's Falcon found drenched on the ground before dawn on 5th, after apparently having hit a sloping roof, was new to Ngulia. It recovered and eventually flew off strongly to the south shortly after noon. Also new to Ngulia was a Whinchat caught at night on 7th, a species

TABLE 1

Numbers of Palaearctic night migrants ringed at Ngulia Safari Lodge between October and February in the years 1969-1979

Species	1978/79	%*	1969/79
Eleonora's Falcon <i>Falco eleonorae</i>	1	-	1
Eurasian Roller <i>Coracias garrulus</i>	9	-	12
Corncrake <i>Crex crex</i>	5	-	5
Spotted Crake <i>Porzana porzana</i>	0	-	1
Eurasian Cuckoo <i>Cuculus canorus</i>	1	-	2
Lesser Cuckoo <i>C. poliocephalus</i>	0	-	1
Eurasian Nightjar <i>Caprimulgus europaeus</i>	21	360	56
Red-backed Shrike <i>Lanius collurio</i>	123	269	403
Red-tailed Shrike <i>L. isabellinus</i>	50	116	315
Hybrid <i>collurio-isabellinus</i>	0	-	2
Tree Pipit <i>Anthus trivialis</i>	1	55	12
Yellow Wagtail <i>Motacilla flava</i>	1	-	3
Golden Oriole <i>Oriolus oriolus</i>	2	-	8
Spotted Flycatcher <i>Muscicapa striata</i>	72	547	151
Great Reed Warbler <i>Acrocephalus arundinaceus</i>	2	92	15
Basra Reed Warbler <i>A. griseldis</i>	25	65	258
Marsh Warbler <i>A. palustris</i>	2104	169	9753
Sedge Warbler <i>A. schoenobaenus</i>	6	133	43
Reed Warbler <i>A. scirpaceus</i>	4	67	41
Icterine Warbler <i>Hippolais icterina</i>	0	-	1
Upcher's Warbler <i>H. languida</i>	18	65	170
Olive-tree Warbler <i>H. olivetorum</i>	21	121	128
Olivaceous Warbler <i>H. pallida</i>	13	52	166
River Warbler <i>Locustella fluviatilis</i>	201	116	1264
Savi's Warbler <i>L. luscinoides</i>	0	-	1
Wood Warbler <i>Phylloscopus sibilatrix</i>	0	-	1
Willow Warbler <i>P. trochilus</i>	146	231	530
Blackcap <i>Sylvia atricapilla</i>	21	573	45
Garden Warbler <i>S. borin</i>	57	130	326
Whitethroat <i>S. communis</i>	2054	175	9235
Barred Warbler <i>S. nisoria</i>	24	50	315
Rufous Bush Chat <i>Cercotrichas galactotes</i>	99	284	320
Irania <i>Irania gutturalis</i>	114	124	679
Sprosser <i>Luscinia luscinia</i>	2839	448	6744
Nightingale <i>L. megarhynchos</i>	67	221	250
Rock Thrush <i>Monticola saxatilis</i>	21	600	43
Isabelline Wheatear <i>Oenanthe isabellina</i>	37	2775	45
Eurasian Wheatear <i>O. oenanthe</i>	30	1200	45
Pied Wheatear <i>O. pleschanka</i>	19	2850	23
Redstart <i>Phoenicurus phoenicurus</i>	0	-	1
Whinchat <i>Saxicola rubetra</i>	2	-	2
Eurasian Swallow <i>Hirundo rustica</i> (at night)	35	875	59
Sand Martin <i>Riparia riparia</i> (at night)	4	-	5
Total ringed	8249		31 480
Number of species	36		42

*The 1978/79 total expressed as a percentage of the 1972/78 mean for each species.

rare in eastern Kenya; P.C. Lack (pers. comm.) had only one record for Tsavo East and we know of no others from Tsavo although the species is listed for the Parks by Williams (1967).

Many Tree Pipits and Yellow Wagtails were heard at night during the early November visit but, as usual, neither species was attracted to the lights to any great extent. The one Yellow Wagtail caught on 7th was only the third ringed at Ngulia. The first Eurasian Roller was seen at night on 7th, and there were three in the trees next night.

The third period of cover, 22 November - 11 December, resulted in 76 per cent of the season's catch (over 6000 birds). Only four nights were unproductive due to lack of mist or (on 9 December) to the moon effect and high winds. Marsh Warblers were already in substantial numbers on 22 November, and 1755 were ringed during this period (max. 242 on 28th). The Sprosser continued to be the most-caught species until the end of the first week in December, when numbers seemed to tail off (2140 ringed during the period, max. 373 on 28th). Whitethroats were in good numbers throughout the period (1653 ringed, max. 286 on 3rd). Capture rates indicated that numbers of passerines around the lights during mist were usually several times higher than under similar conditions during early November.

The nine days 25 November - 3 December were particularly productive with the following 24h ringing totals: 581, 567, 847, 435, 816, 613, 337, 195 and 739. The night of 26/27 November deserves special mention. Mist came down at 21:00, and birds quickly appeared in scores below the lights. After an hour of heavy rain, catching began at 22:00 but had to be curtailed by 23:00 by partially closing the net. The net was fully closed between 03:00 and 04:00 to enable the bulk of the accumulated birds to be ringed. The night's catch of 525 included no less than four Corncrakes (the first to be ringed at Ngulia and in East Africa), five Eurasian Rollers, one Eurasian Cuckoo, a Great Reed Warbler and a second Whinchat. The harsh conditions, with further heavy showers in the early hours, caused a large number of birds, estimated as over 10 000, to remain near the Lodge until dawn. Seven nets, totalling 120 m, were operated in the bush from 05:45 to 11:00 and produced a further 322 migrants. The majority were Sprossers, but good numbers of Marsh Warblers and White-throats were included, as well as a second Great Reed Warbler, and 29 Red-backed Shrikes, bringing the day's total for this species to 41, a record for Ngulia.

During this late November to early December period, Eurasian Rollers were often numerous at night, with up to 200 resting in a single tree; nine were caught. This species has been seen at night each year since the first visit by A.D. Forbes-Watson in 1969 (see Moreau 1972: 265), but had never previously been caught. The Roller is a well known diurnal migrant, and loose flocks are regularly recorded flying south down the Ngulia valley during daytime, usually in early December. Whether the Roller, or for that matter the Eurasian Swallow and the Sand Martin, *migrate* over Tsavo at night remains conjectural. Diurnal migrants will perforce migrate at night when they find themselves over inhospitable terrain (such as deserts or oceans) at dusk, just as nocturnal migrants will have to travel at times by day. Rollers and Swallows are most often seen at night at Ngulia during storms, which suggests perhaps that heavy rain has caused them to leave their roosting places and head off, only to be later confused by the Ngulia lights.

Misty nights predominated again during the fourth period of cover

(27 December - 7 January), but the volume of migration by this time was greatly reduced, so that these 12 days produced only 780 new birds. Very few birds were seen at night, even under perfect mist conditions, and the highest night catch of 70 (on 28 December) was achieved in 3h using two 18m nets - a combination which would have been quite unmanageable earlier in the season. Marsh Warblers and Whitethroats continued to be the main species while Sprossers (19 ringed in all) had virtually stopped moving. River Warbler (32 ringed) and Willow Warbler (22) continued to appear in small numbers and Garden Warbler (43) became more numerous, especially in the lush fruiting bush south of the staff village. Seventeen Blackcaps ringed in this period were exceptional, and a number of retraps showed that some were making an extended stopover, relying for food on the abundant berry crop. The number of retraps increased during late December/early January as has been noted in other years, but one bird in particular was of considerable interest: a first winter River Warbler originally ringed on 8 December at 15.7g, fat 1 was retrapped on 6 January at 07:00 when it weighed 19.5g, fat 3 - a 24 per cent increase in weight. In spite of the large number of birds handled during the season, only one was a retrap from an earlier year, a Red-tailed Shrike which had been ringed on 25 January 1977 and was retrapped on 2 January 1979.

DISCUSSION

Ngulia Lodge has been manned effectively since late 1971. During these eight years much has been learned about the southward night migration, and many aspects of the phenomenon are now predictable. However, new problems are raised each year and, in many cases, explanations can be conjectural at best. A few questions relating to catch composition are discussed below.

The broad change in species' composition during the course of the migration period has already been discussed (Pearson & Backhurst 1978). General conclusions were further supported by catches made during 1978/1979, and Table 2 brings analysis of this aspect up to date. Catch composition also shows marked fluctuation from one day to the next, not only in the case of the minor species, but also as regards the contribution of the three major ones as well. This could be the result of changes in the composition of the overhead migration, with implied species differences in the numbers taking off over a wide departure area from one night to the next. It could also, however, result from a tendency to local flocking on the part of individual species during the course of migration, perhaps after meeting misty conditions. Surprisingly, there has been little indication of change in proportions of the main species from one hour to the next of the same night. When night catching has continued from near midnight to dawn, the broad catch composition has not usually varied, even on occasions with patchy mist when birds were arriving and departing the whole time. Thus, large scale species aggregation would not seem to occur during the migration of the birds involved, and we are led to the view that major daily species differences in the catch are due mainly to factors influencing migration take-off.

For the less common species, a different reason for day to day fluctuation probably also applies. There are often indications of association of birds into small parties, probably after their disorientation by the lights. Willow Warblers and Iranias may be mentioned in particular. These species are handled in quite small numbers, yet indi-

TABLE 2

An analysis of the 18 main species of Palaearctic night migrants ringed at Ngulia Safari Lodge between 1 November and 16 January, shown as percentages of the total half-month catch for the years 1972-1979

Species	Nov I	Nov II	Dec I	Dec II	Jan I
Eurasian Nightjar	1.3	0.1	*	0	0.1
Red-backed Shrike	3.5	2.1	0.4	0.1	0.5
Red-tailed Shrike	1.3	1.3	0.5	1.1	0.9
Spotted Flycatcher	3.5	0.3	0.1	*	0
Basra Reed Warbler	0.2	1.0	1.0	0.5	0.8
Marsh Warbler	8.1	27.7	37.1	37.9	40.3
Upcher's Warbler	0.3	0.4	0.5	0.8	1.6
Olive-tree Warbler	1.1	0.6	0.2	0	0
Olivaceous Warbler	1.5	0.5	0.3	0.4	0.4
River Warbler	1.6	3.9	5.2	3.4	3.9
Willow Warbler	1.6	1.0	2.2	2.4	2.0
Garden Warbler	0.2	0.3	0.9	2.1	5.2
Whitethroat	18.8	27.2	30.7	37.0	32.8
Barred Warbler	1.1	0.8	0.7	1.3	2.9
Rufous Bush Chat	5.6	0.9	0.3	0.2	0
Irania	3.2	1.8	1.8	3.1	2.0
Sprosser	40.9	28.4	16.8	7.9	4.7
Nightingale	2.9	1.0	0.4	0.3	0.2
% birds/half month	9.3	37.4	34.5	14.6	4.3
No. of birds/half month	2854	11 504	10 598	4497	1314

Percentages are rounded to the nearest 0.1 per cent, those less than 0.05 per cent (but greater than 0) are shown by an asterisk (*).

Individuals are often caught, perhaps three or four together, close to one another in the same net at night. Table 3, which covers nine days of large catches in late November/early December 1978, serves to demonstrate the extent of day to day catch differences. It may also be noted that during this season, both Great Reed Warblers were caught on the same date, four of the five Corncrakes were caught during the same night and 15 of the 21 Eurasian Nightjars were caught on one night.

Year to year catch differences are also of interest, and may of course be related to breeding success or changes in migration strategy. The predominance of one or the other of the main species may vary from year to year. Thus, Sprossers dominated catches throughout the first six weeks of the 1978 migration period to an extent previously only experienced in 1974. Annual differences in relative abundance tend to be more marked in the case of the minor species, however. Thus, during the 1978/79 season, the overall contributions of Basra Reed Warbler, Olivaceous Warbler, Upcher's Warbler and Barred Warbler were particularly low (see Table 1), whilst those of the three wheatear species were far higher than usual. As mentioned above (p. 19) wheatears formed the bulk of the small catch of 30 October, thus supporting our view that they are early migrants, seldom caught in 'normal' years because of lack of suitable weather at the time of their peak passage. However, all three species continued to appear at night in small numbers later in the migration (although the last Pied was

TABLE 3

Totals of eight species expressed as percentages of the daily catch during nine consecutive days in late November and early December 1978

Species	NOVEMBER					DECEMBER			
	25	26	27	28	29	30	1	2	3
Red-backed Shrike	2.2	0.9	4.8	1.1	0.7	0.7	0.6	0	0.1
Marsh Warbler	37.7	34.6	20.9	33.6	29.7	34.7	11.6	30.0	21.8
River Warbler	2.4	0.9	2.0	2.8	3.6	2.4	1.8	1.0	1.8
Willow Warbler	0.3	0.7	3.3	0.9	0.4	0.8	0	1.0	2.0
Whitethroat	17.2	23.1	23.1	23.2	16.2	21.2	41.8	36.9	38.7
Irania	1.0	1.9	1.4	1.6	0.5	3.6	0.3	0	0.7
Sprosser	34.6	33.3	38.4	31.0	45.7	33.0	39.2	27.2	33.4
Nightingale	0.5	0.5	0.1	1.4	0.7	0.3	0.6	0.5	0.1
Total daily catch (birds)	581	567	847	435	816	613	337	195	739

on 3 December), to an extent not seen in previous years. Wheatears prefer dry open areas and this habitat was scarcer than usual due to the excessive rainfall. We suggest that continued appearances at night were the result of increased movement of wheatears in search of suitable wintering areas. Numbers of wheatears seen during the day, and the relative abundance of the three species in Tsavo, were not noticeably different during November and December than in other years.

Other questions of interest concern species which are regularly heard at night, but rarely caught, and species for which a marked bias exists towards the night catch as compared to the bush catch, or *vice versa*. Tree Pipits and Yellow Wagtails have already been mentioned. These species are commonly heard in the mist on some nights each year, especially in November, but are rarely seen on the ground, or caught. We have the impression that these two species are less disorientated by the lights, perhaps because they tend to fly higher in the mist, but it is still surprising that they are not brought down in larger numbers on nights of torrential rain. It is possible that the vocal activity of these birds has given a misleading idea of numbers migrating at night relative to other species. However, some real difference in behaviour as compared with the warblers and small thrushes does seem to be indicated.

Palaeartic shrikes are occasionally netted at night, but tend to contribute much more to bush catches. They are often caught quite late in the morning, and remain around the Lodge for most of the day. Presumably when grounded, shrikes have less tendency to depart rapidly at dawn than most other migrants. By contrast, the Willow Warbler and River Warbler can be identified as species contributing mainly to night catches. The former probably tends to evade nets during the day by keeping to the tops of trees and tall bushes. The latter is particularly prone to enter the Lodge building, where a high proportion of the night birds are picked up by hand, whilst during the daytime the species is largely terrestrial and difficult to net, often preferring to run on the ground rather than to fly.

Over 31 000 Palaeartic migrants have been ringed at Ngulia in autumn between 1969 and early 1979 yet not a single bird wearing a foreign ring has been controlled, even though there have been 14 foreign recoveries

of Ngulia-ringed birds, and four of these have been to countries with substantial ringing schemes. This apparently strange situation presumably reflects the vast numbers of birds which leave their breeding grounds unringed, compared with the relatively minute numbers caught at Ngulia. Only seven birds ringed at Ngulia have been retrapped there in a subsequent season. This is, however, not surprising. Bearing in mind the vast numbers of birds involved, it follows that the chances of a bird ringed in season 'A' (when it was probably grounded by a combination of mist and moonless conditions) being over Ngulia in season 'B' or 'C' under similar conditions *and* being netted, must be remote. It is significant in this context that all the birds which *have* been retrapped in subsequent seasons have been caught at times which strongly suggest that Ngulia is their final winter destination.

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